VGA Extender
VGA Extender with Audio
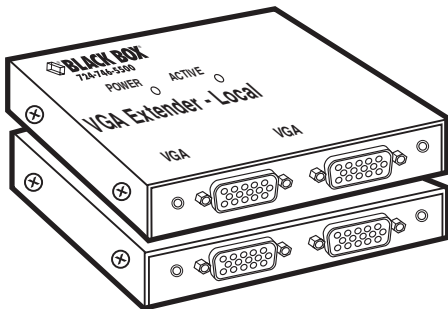
FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

A: El cable de poder o el contacto ha sido dañado; u

B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

C: El aparato ha sido expuesto a la lluvia; o

D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

E: El aparato ha sido tirado o su cubierta ha sido dañada.

TRADEMARKS USED IN THIS MANUAL

BLACK BOX and the Double Diamond logo are registered trademarks of BB Technologies, Inc.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

Contents

1. Specifications

Maximum Distance: 500 ft. (152.4 m)

Resolution: Up to 1024 x 768

User Controls: (1) equalizer selector switch

Connectors: <u>AC555A-R2</u>
Local :	(2) VGA HD15 female out
	(1) VGA HD15 male in
	(1) RJ-45 female CAT5 out
	(1) 5-VDC power
Remote :	(2) VGA HD15 female out
	(1) RJ-45 female CAT5 in
	(1) 5-VDC power

Connectors: <u>AC555A-4-R2</u>
Local :	(1) VGA HD15 female out
	(1) VGA HD15 male in
	(4) RJ-45 female CAT5 out
	(1) 5-VDC power

Connectors: <u>AC555A-REM-R2</u>
Remote :	(2) VGA HD15 female out
	(1) RJ-45 female CAT5 in
	(1) 5-VDC power

Connectors: <u>AC556A-R2</u>
Local:	(2) VGA HD15 female out
	(1) VGA HD15 male in
	(1) RJ-45 female CAT5 out
	(1) 5-VDC power
	(1) Stereo jack audio female in
	(2) Stereo jack audio female out
Remote:	(2) VGA HD15 female out
	(1) RJ-45 female CAT5 in
	(1) 5-VDC power
	(2) Stereo jack audio female out

Indicators: On each local and remote unit: (1) Power, (1) Active

Power: 5 VDC, 2A

Size: AC555A-R2 : 0.6"H x 3.3"W x 2.3"D (1.5 x 8.4 x 5.8 cm);
AC555A-4-R2: 0.8"H x 7.2 "W x 3.4"D (2.0 x 18.2 x 8.7cm);
AC555A-REM-R2: 0.6"H x 3.3 "W x 2.3"D (1.5 x 8.4 x 5.8cm);
AC556A-R2 (each unit): 0.6"H x 4.1"W x 2.3"D (1.5 x 10.4 x 5.8 cm)

2. Overview

2.1 Introduction

The VGA Extender (AC555A-R2) enables you to transmit VGA signals up to 500 feet (152.4 m) away with resolution up to 1024 x 768. Common mode noise suppression circuits provide superb VGA quality via CAT5, 5e, or 6 unshielded twisted-pair cables.

The extender consists of a local unit and a remote unit. The local unit duplicates the input signal for local use and transmits the VGA signal to the remote unit. When the remote unit receives the VGA signal via a CAT5 RJ-45 connector, it broadcasts the signal to two VGA outputs. A convenient Equalization (gain) selector switch on the remote unit gives you optimum signal clarity, depending on the length of the CAT5, 5e, or 6 cable.

You can also order the local and remote units separately:

- Transmitter Only (Local Unit), part number AC555A-4-R2

- Receiver Only (Remote Unit), part number AC555A-REM-R2

The VGA Extender with Audio (AC556A-R2) has all the functions of the AC555A-R2 plus it includes an audio signal.

Both extender pairs are ideal for public broadcasting, exhibits, retail stores, courtrooms, stock tickers, bus stations, and many other applications.

2.2 Components

The AC556A-R2 local and remote units are pictured in Figures 2-1 and 2-2. Tables 2-1 and 2-2 list the descriptions identified by the circled numbers in Figures 2-1 and 2-2.

NOTE

The AC555A-R2 has the same components as the AC556A-R2, except for the audio connectors.
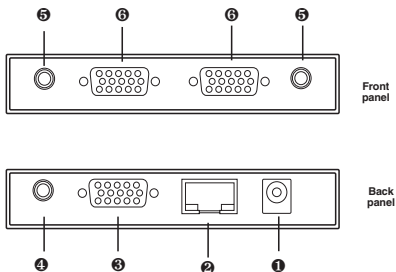
Figure 2-1. VGA Extender with Audio, local unit.

Table 2-1. Connectors, indicators, and user controls on the local unit.

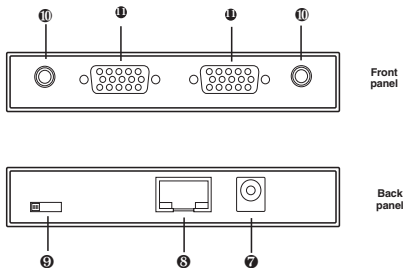| Component	Description
❶ Power connector	5-VDC power input
❷ RJ-45 connector	CAT5 output to a remote unit
❸ HD15 input connector	VGA input from a VGA source
❹ Audio input connector	Audio input from an audio source
❺ Two audio output connectors	Audio output to speakers
❻ Two HD15 output connectors	VGA output to monitors

Front panel

Back panel

Figure 2-2. VGA Extender with Audio, remote unit.

Table 2-2. Connectors, indicators, and user controls on the remote unit.

Component	Description
❼ Power connector	5-VDC power input
❽ RJ-45 connector	CAT5 input from a local unit
❾ Equalizer selector switch	Optimizes signal clarity
❿ Two audio output connectors	Audio output to speakers
⓫ Two HD15 output connectors	VGA output to monitors

2.3 What's Included

Your packages should include the following items. If anything is missing or damaged, please contact Black Box at 724-746-5500.

AC555A-R2

- (1) Local unit

- (1) Remote unit

- (2) Power supplies, one for each unit

- (1) VGA cable (male-female)

- This user's manual

AC555A-4-R2

- (1) Local unit

- (1) Power supply

- (1) VGA cable (male-female)

- This user's manual

AC555A-REM-R2

- (1) Remote unit

- (1) Power supply

- (1) VGA cable (male-female)

- This user's manual

AC556A-R2

- (1) Local unit

- (1) Remote unit

- (2) Power supplies, one for each unit

- (1) VGA cable (male-female)

- (1) Audio cable

- This user's manual

2.4 What You'll Need to Supply

- (1) VGA source, such as a monitor

- Category 5, 5e, or 6 cables, straight-pinned to the EIA/TIA 568A or 568B industry standard

3. Installation

You'll need one local and one remote unit (AC555A-R2 includes both, or order AC555A-4-R2 and AC555A-REM-R2 separately), a VGA source such as a monitor (not included), Category 5, 5e, or 6 cable (not included), and power supplies (one for each unit, included). Follow the steps listed on the next page and refer to Figures 2-1, 2-2, and 3-1 as you install the extenders.

The AC556A-R2 accepts one stereo signal (the left and right channels) input on an audio jack (similar to a computer). The stereo signal is broadcast to the two local audio outputs and is "mixed" together to form a mono signal before transmitting to a remote unit via CAT5, 5e, or 6 cable. Therefore, the left channel and the right channel audio signals at a remote unit are the same.

After all connections are secure, you may plug the power adapters into the local and remote units' power receptacles; then plug the power adapters into AC outlets.
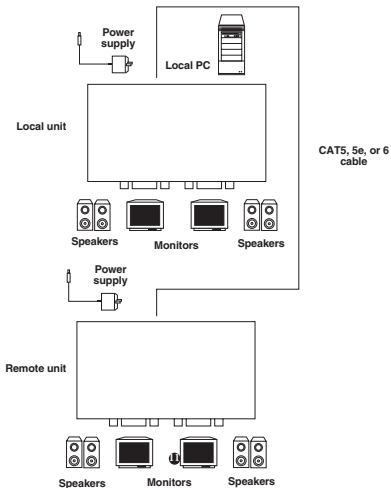
Figure 3-1. Typical installation.

3.1 Local Unit Connections

1. Make sure that all devices that you will connect to the extenders are powered off.

NOTE

If you are unsure of what type of cable or cable length to use, call Technical Support at 724-746-5500.

2. Using the included VGA cable, connect the local unit's HD15 input connector (labeled ❸ in Figure 2-1) to the VGA source (for example, a PC).

3. Using the monitors' cables, connect two output monitors to the local unit's HD15 output connectors (labeled ❻ in Figure 2-1).

4. Using audio cable, connect the local unit's audio input connector (labeled ❹ in Figure 2-1) to the VGA source's audio connector. (This step does not apply to the AC555A-R2 and AC555A-4-R2; they do not support audio connections.)

5. Connect the local unit's two audio output connectors (labeled ❺ in Figure 2-1) to two sets of speakers. (This step does not apply to the AC555A-R2 and AC555A-4-R2; they do not support audio connections.)

3.2 Remote Unit Connections

6. Using the monitors' cables, connect two output monitors to the remote unit's HD15 output connectors (labeled ⓫ in Figure 2-2).

7. Connect the remote unit's audio output connectors (labeled ❿ in Figure 2-2) to the VGA source's audio connectors. (This step does not apply to the AC555A-R2 and AC555A-REM-R2; they do not support audio connections.)

3.3 Connecting the Local Unit to the Remote Unit

8. Using Category 5, 5e, or 6 cable, connect the local unit's CAT5 output port (labeled ❷ in Figure 2-1) to the remote unit's CAT5 input port (labeled ❽ in Figure 2-2).

9. Connect each unit's power supply to its power supply connector (the local power connector is labeled ❶ in Figure 2-1, and the remote power connector is labeled ❼ in Figure 2-2).

10. Power on the local and remote units.

4. Operation

Once the VGA Extender is installed, monitor the extender's operation via its LEDs. Also, use the equalizer selector switch to adjust the VGA signal for various cable lengths and characteristics.

4.1 LEDs

There are two LEDs on each unit. On the local unit, the Power LED lights when proper power is supplied to the unit. The Active LED lights when the extender detects a VGA input signal.

On the remote unit, the Power LED lights when the unit is properly powered. The Active LED lights when the extender properly decodes VGA signals for the two local HD15 VGA ports. If the AC556A-R2 is used to transmit audio signals only, the Active LED never turns on.

4.2 Equalizer Selector Switch

Adjust the equalizer selector switch on the remote unit (labeled ❾ in Figure 2-2) for optimum video signals for various cable lengths. Choose from the four lengths listed in Table 4-1.

Table 4-1. Equalizer selector switch settings.

CAT5, 5e, or 6 Cable Length	Equalizer Selector Switch Position
0–131 feet (0–40 m)	–
131–262 feet (40–80 m)	– – –
262–394 feet (80–120 m)	– – – –
394–525 feet (120–160 m)	– – – – –

Appendix. Troubleshooting

A.1 Problems/Solutions

Problem: No VGA signals are received at the remote unit.

Solution: Make sure that both the local and remote units are powered on. The Active LED will light on both units to indicate that the signal is correct.

Problem: The VGA signal is garbled.

Solution: Make sure that the wires inside the cable conform to the straight-pinned EIA/TIA 568A or 568B standard.

Problem: The Active LED on the remote unit is always off.

Solution: The Active LED on the local unit must be on. Check the CAT5, 5e, or 6 cable wiring. Make sure that the Power LED on the remote unit is on.

Problem: The VGA quality changes when you change cables.

Solution: Use the equalizer selector switch to adjust the VGA signal for various cable lengths and characteristics.

Problem: There's no audio signal at the remote unit.

Solution: Make sure that the volume is high enough.

A.2 Calling Black Box

If you determine that your VGA Extender or VGA Extender with Audio is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.

- when the problem occurs.

- the components involved in the problem.

- any particular application that, when used, appears to create the problem or make it worse.

A.3 Shipping and Packaging

If you need to transport or ship your VGA Extender or VGA Extender with Audio:

- Package it carefully. We recommend that you use the original container.

- If you are shipping the VGA Extender or VGA Extender with Audio for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.

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